

XXXI. *On certain changes which appear to have taken place in the positions of some of the principal fixed Stars.* By JOHN POND, *Astronomer Royal, F. R. S.*

Read June 19, 1823.

SINCE the date of my last communication on the subject of the deviation of the fixed stars from their computed or predicted places, I have been induced to examine such intermediate observations, as appeared likely to throw some light on this difficult subject.

The observations that best deserve attention since the time of BRADLEY, are the few which were made by the French astronomers, in their Trigonometrical Operations, about the year 1793, and those of Greenwich, Armagh, Westbury and Palermo, some years later, as published in the Philosophical Transactions for the year 1806. As the computations and tables relating to this investigation are subjoined, it will only be requisite, briefly, to state the result. It appears to me, that these observations greatly add to the probability that some variation, either continued or periodical, takes place in the sidereal system, which, producing but very small deviations in a finite portion of time, has hitherto escaped notice.

That in consequence of this, it becomes impossible, even if two perfectly exact observations of a star could be made at distant intervals, either by interpolation to assign its place for any intermediate period, or to predict its place for the future, contrary to the theory hitherto received. The nature

of this motion appears to be such, that the stars are now mostly found a considerable quantity to the southward of their computed or predicted places. With respect to the laws by which these motions are governed, the observations in question are not sufficiently exact to throw any light upon them.

Upon this very difficult point we must, I am inclined to think, rely chiefly, if not entirely, on the Greenwich observations; and as I have already fully discussed this question in my former Paper, I am unwilling, particularly at this advanced period of the season, to trespass any longer on the attention of the Royal Society.

TABLE I.

		Greenwich. 1800.	Armagh.	Palermo.	Westbury.	Westbury, 2 feet Circle.	Promiscuous Observations.	Mean of 4 Catalogues.
		° ' "	"	"	"	"	"	° ' "
1	Polaris							
2	β Ursæ Min.							
3	β Cephei							
4	α Ursæ Maj.							
5	α Cephei							
6	α Cassiop.							
7	γ Ursæ Maj.							
8	γ Draconis	38 28 54.0	54.0	54.0	54.0			38 28 54.0
9	η Ursæ Maj.							
10	α Persei							
11	Capella	44 13 21.5	21.5	21.0	18.7		18.0	44 13 20.1
12	α Cygni	45 25 41.4	39.5	38.7	37.2			45 25 39.2
13	α Lyre	51 23 41.1*	37.3	37.7	36.2		35.0	51 23 36.5
14	Castor	57 41 15.0	* 9.5	13.5	14.2			57 41 14.2
15	Pollux	61 30 10.9	* 5.3	11.7	13.9			61 30 12.2
16	β Tauri	61 34 32.1	32.5	33.0	33.9			61 34 32.9
17	α Androm.	62 0 47.0	45.2	49.5	50.2			62 0 48.0
18	α Cor. Bor.	62 36 11.7	* 7.5	10.5	13.2			62 36 11.8
19	α Arietis	67 29 21.8	23.5	22.0	20.6			67 29 22.0
20	Arcturus	69 46 10.8	11.2	10.2	7.7			69 46 10.0
21	Aldebaran	73 54 20.0	18.5	16.5	15.7			73 54 17.7
22	β Leonis	74 18 37.9	34.2	33.8	32.7			74 18 34.7
23	α Herculis							
24	α Pegasi	75 52 0.5	1.3	1.4	58.2			75 52 0.2
25	γ Pegasi	75 55 39.8	37.7	* 41.9	37.2			75 55 38.2
26	Regulus	77 3 38.8	* 32.2	36.5	34.2			77 3 36.5
27	α Ophiuchi	77 16 57.8	53.6	55.5	53.7			77 16 55.1
28	α Aquilæ	81 38 56.2	50.8	53.3	51.7			81 38 53.0
29	α Orionis	82 38 35.0	32.0	33.5	31.7			82 38 33.0
30	α Serpentinis	82 56 5.4	* 0.0	4.8	2.4			82 56 4.2
31	Procyon	84 16 21.7	19.5	20.0	21.7	22.5		84 16 21.1
32	α Ceti	86 42 10.4	7.5	9.7	10.4			86 42 9.5
33	α Aquarii	91 17 4.6	4.8	4.6	4.8			91 17 4.7
34	α Hydræ	97 47 54.3	49.0	53.0	53.2			97 47 52.4
35	Rigel	98 26 34.2	33.2	34.9	30.7			98 26 34.7
36	Spica Virg.	100 6 42.7	39.0	42.5	43.2			100 6 41.9
37	2 α Capricor.	103 9 9.1	13.5	8.7	8.2			103 9 9.9
38	Sirius	106 27 2.3	5.3	4.7	2.2	3.0	1.5	106 27 3.1

* These are omitted in the calculations.

TABLE II.

		N. P. D. 1756. Co-Lat. 38° 51' 21", 0	N. P. D. 1800. Greenwich.	Motion in 44 Years.	Motion in 32 Years.	Correction.	Ann. Var. 1811 X 22.	Predicted N. P. D. 1822.	Stars observed South of pre- dicted Places.
		° ' "	° ' "	' "	' "	"	' "	° ' "	"
1	Polaris								
2	β Ursæ Min.	14 50 49,0							
3	β Cephei	20 30 22,9							
4	α Ursæ Maj.	26 56 16,7							
5	α Cephei	28 26 28,7							
6	α Cassiop.	34 48 17,4							
7	γ Ursæ Maj.	34 56 56,4							
8	γ Draconis	38 28 21,2	38 28 54,0	+ 0 32,8	+ 0 16,4	-1,5	+ 0 14,9	38 29 8,9	+ 0,9
9	η Ursæ Maj.	39 27 40,2							
10	α Persei	41 4 47,8							
11	Capella*	44 16 51,0	44 13 21,5	- 3 29,5	- 1 44,7	-4,6	- 1 40,1	44 11 41,4	0,0
12	α Cygni*	45 34 51,9	45 25 41,4	- 9 10,5	- 4 35,2	+1,7	- 4 36,9	45 21 4,5	+ 0,6
13	α Lyræ*	51 25 46,6	51 23 41,1	- 2 5,5	- 1 2,8	+2,2	- 1 5,0	51 22 36,0	- 1,8
14	Castor	57 36 10,2	57 41 15,0	+ 5 4,8	+ 2 32,4	+3,8	+ 2 36,2	57 43 51,2	+ 0,8
15	Pollux	61 24 27,9	61 30 10,9	+ 5 43,0	+ 2 51,5	+3,6	+ 2 55,1	61 33 6,0	+ 3,0
16	β Tauri	61 37 30,4	61 34 32,1	- 2 58,3	- 1 29,1	-4,0	- 1 25,1	61 33 7,0	+ 3,4
17	α Androm.	62 15 26,8	62 0 47,0	-14 39,8	- 7 19,9	0,0	- 7 19,9	61 53 27,1	+ 5,4
18	α Cor. Bor.	62 26 59,7	62 36 11,7	+ 9 12,0	+ 4 36,0	-2,1	+ 4 33,9	62 40 45,6	+ 2,6
19	α Arietis	67 42 12,4	67 29 21,8	-12 50,6	- 6 25,3	-1,7	- 6 23,6	67 22 58,2	+ 3,5
20	Arcturus	69 32 13,2	69 46 10,8	+13 57,6	+ 6 58,8	-1,5	+ 6 57,3	69 53 8,1	+ 2,1
21	Aldebaran	74 0 14,9	73 54 20,0	- 5 54,9	- 2 57,4	-3,4	- 2 54,0	73 51 26,0	- 0,5
22	β Leonis	74 3 55,1	74 18 37,9	+14 42,8	+ 7 21,4	+0,3	+ 7 21,7	74 25 59,6	- 1,4
23	α Herculis	75 18 45,6	75 22 7,1	+ 3 21,5	+ 1 40,7	-2,9	+ 1 37,8	75 23 44,9	+ 10,7
24	α Pegasi	76 6 10,2	75 52 0,5	-14 9,7	- 7 4,8	+0,9	- 7 5,7	75 44 54,8	+ 6,4
25	γ Pegasi	76 10 25,7	75 55 39,0	-14 45,9	- 7 22,9	0,0	- 7 22,9	75 49 16,9	+ 5,4
26	Regulus	76 51 4,7	77 3 38,8	+12 34,1	+ 6 17,0	+1,8	+ 6 18,8	77 9 57,6	+ 0,4
27	α Ophiuchi	77 14 35,4	77 16 57,8	+ 2 22,4	+ 1 11,2	-3,0	- 1 8,2	77 18 6,0	+ 1,4
28	α Aquilæ	81 45 27,3	81 38 56,2	- 6 31,1	- 3 15,5	+2,9	- 3 18,4	81 35 37,8	+ 0,9
29	α Orionis	82 39 41,8	82 38 35,0	- 1 6,8	- 0 33,4	-3,4	- 0 30,0	82 38 5,0	+ 0,7
30	α Serpentis	82 47 24,2	82 56 5,4	+ 8 40,8	+ 4 20,4	-2,5	- 4 17,9	83 0 23,3	+ 1,7
31	Procyon	84 10 19,8	84 16 21,7	+ 6 11,9	+ 3 5,9	+3,1	+ 3 9,0	84 19 30,7	+ 3,9
32	α Ceti	86 52 57,7	86 42 10,4	-10 47,3	- 5 23,6	-2,2	- 5 21,4	86 36 49,0	+ 2,4
33	α Aquarii	91 29 41,4	91 17 4,6	-12 36,8	- 6 18,4	+1,7	- 6 20,1	91 10 44,5	+ 4,1
34	α Hydre	97 36 50,2	97 47 54,3	+11 4,1	+ 5 32,0	+2,0	- 5 34,0	97 53 28,3	+ 1,0
35	Rigel	98 30 10,9	98 26 34,2	- 3 36,7	- 1 48,3	-2,9	- 1 45,4	98 24 48,8	+ 4,4
36	Spica Virg.	99 52 48,3	100 6 42,7	+13 54,4	+ 6 57,2	-1,1	+ 6 56,1	100 13 38,8	+ 3,0
37	2 α Capricor.	103 16 53,0	103 9 9,1	- 7 43,9	- 3 51,9	+3,1	- 3 55,0	103 5 14,1	+ 3,3
38	Sirius	106 23 56,7	106 27 2,3	+ 3 5,6	+ 1 32,8	+2,7	+ 1 35,5	106 28 37,8	+ 6,5

*** DR. MASKELYNE considered the determination of these three stars as erroneous, and assigned corrections amounting to two or three seconds—vide Greenwich Observations.

TABLE III.

		N. P. D. 1756. Co-Lat. 38 31, 21, 0	Westbury, N. P. D. 1800.	Motion in 44 Years.	Motion in 22 Years.	Correction.	Ann. Var. 1811 X 22.	Predicted N. P. D. 1822.	Stars observed South of pre- dicted Places.
		° ' "	° ' "	" "	" "	" "	" "	° ' "	" "
1	Polaris								
2	β Ursæ Min.	14 50 49,0	15 1 36,8	+10 47,8	+ 5 23,9	+0,2	+5 24,1	15 7 0,9	— 0,1
3	β Cephei	20 30 22,9							
4	α Ursæ Maj.	26 56 16,7							
5	α Cephei	28 26 28,7							
6	α Cassiopeia	34 48 17,4							
7	γ Ursæ Maj.	34 56 56,4							
8	γ Draconis	38 28 21,2	38 28 53,6	+ 0 32,4	+ 0 16,2	—1,5	+0 14,7	38 29 8,3	+ 1,5
9	η Ursæ Maj.	44 16 51,0							
10	α Persei	45 34 51,9							
11	Capella	44 16 51,0	44 13 19,2	— 3 31,8	— 1 45,9	—4,6	—1 41,3	44 11 37,9	+ 3,5
12	α Cygni	45 34 51,9	45 25 37,8	— 9 14,1	— 4 37,0	+1,7	—4 38,7	45 20 59,1	+ 6,0
13	α Lyrae	51 25 46,6	51 23 36,7	— 2 9,9	— 1 5,0	+2,2	—1 7,2	51 22 29,5	+ 4,7
14	Castor	57 36 10,2	57 41 14,2	+ 5 4,0	+ 2 32,0	+3,8	+2 35,8	57 43 50,0	+ 2,0
15	Pollux	61 24 27,9	61 30 13,5	+ 5 45,6	+ 2 52,8	+3,6	+2 56,4	61 33 9,9	— 0,9
16	β Tauri	61 37 30,4	61 34 34,0	— 2 56,4	— 1 28,2	+4,0	—1 24,2	61 33 9,8	+ 0,6
17	α Androm.	62 15 26,8	62 0 49,3	—14 37,5	— 7 18,7	0,0	—7 18,7	61 53 30,6	+ 1,9
18	α Cor. Bor.	62 26 59,7	62 36 12,1	+ 9 12,4	+ 4 36,2	—2,1	+4 34,1	62 40 46,2	+ 2,0
19	α Arietis	67 42 12,4	67 29 21,8	—12 50,6	— 6 25,3	—1,7	—6 23,6	67 22 58,2	+ 3,5
20	Arcturus	69 32 13,2	69 46 9,4	+13 56,2	+ 6 58,1	—1,5	+6 56,6	69 53 6,0	+ 4,2
21	Aldebaran	74 0 14,9	73 54 17,1	— 5 57,8	— 2 58,9	—3,4	—2 55,5	73 51 21,6	+ 3,9
22	β Leonis	74 3 55,1	74 18 33,8	+14 38,7	+ 7 19,3	+0,3	+7 19,6	74 25 53,4	+ 4,8
23	α Herculis	75 18 45,6							
24	α Pegasi	76 6 10,2	75 51 59,9	—14 10,3	— 7 5,1	+0,9	—7 6,0	75 44 53,9	+ 7,3
25	γ Pegasi	76 10 25,7	75 55 38,7	—14 47,0	— 7 23,5	0,0	—7 23,5	75 48 15,2	+ 7,1
26	Regulus	76 51 4,7	*77 3 35,0	+12 30,3	+ 6 15,1	+1,8	+6 16,9	77 9 51,9	+ 6,1
27	α Ophiuchi	77 14 35,4	77 16 54,4	+ 2 19,0	+ 1 9,5	—3,0	+1 6,5	77 18 0,9	+ 6,5
28	α Aquilæ	81 45 27,3	81 38 52,8	— 6 34,5	— 3 17,2	+2,9	—3 20,1	81 35 32,7	+ 6,0
29	α Orionis	82 39 41,8	82 38 32,8	— 1 9,0	— 0 34,5	—3,4	—0 31,1	82 38 1,7	+ 4,0
30	α Serpentis	82 47 24,2	82 56 3,5	+ 8 39,3	+ 4 19,6	—2,5	+4 17,1	83 0 20,6	+ 4,4
31	Procyon	84 10 9,8	84 16 22,3	+ 6 12,5	+ 3 6,2	+3,1	+3 9,3	84 19 31,6	+ 3,0
32	α Ceti	86 52 57,7	86 42 10,1	—10 47,6	— 5 23,8	—2,2	—5 21,6	86 36 48,5	+ 2,9
33	α Aquarii	91 29 41,4	91 17 5,0	—12 36,4	— 6 18,2	+1,7	—6 19,9	91 10 45,1	+ 3,5
34	α Hydræ	97 36 50,2	97 47 54,5	+11 4,3	+ 5 32,1	+2,0	+5 34,1	97 53 28,6	+ 0,7
35	α Rigel	98 30 10,9	98 26 37,6	— 3 33,3	— 1 46,6	—2,9	—1 43,7	98 24 53,9	— 0,7
36	Spica Virg.	99 52 48,3	100 6 44,2	+13 55,9	+ 6 57,9	—1,1	+6 56,8	100 13 41,0	+ 0,8
37	α Capricor.	103 16 53,0	103 9 10,3	— 7 42,7	— 3 51,3	+3,1	—3 54,4	103 5 15,9	+ 1,5
38	Sirius	106 23 56,7	106 27 4,3	+ 3 7,6	+ 1 33,8	+2,7	+1 36,5	106 28 40,8	+ 3,5

* This determination of Regulus was from two imperfect observations only, and is therefore probably erroneous.

TABLE IV.

		N. P. D. 1756. Co. Lat. 38 31 21,0	N. P. D. 1800. Mean of 4 Catalogues.	Motion in 44 years.	Motion in 22 years.	Corrections.	Ann. Var 1811 X 22.	Predicted N. P. D. 1822.	Stars observed South of pre- dicted Places.
		° ' "	° ' "	' "	"	"	' "	° ' "	
1	Polaris.								
2	β Ursæ Min.	14 50 49,0							
3	β Cephei	20 30 22,9							
4	α Ursæ Maj.	26 56 16,7							
5	α Cephei	28 26 28,7							
6	α Cassiopeiæ	34 48 17,4							
7	γ Ursæ Maj.	34 56 56,4							
1	γ Draconis	38 28 21,2	38 28 54,0	+ 0 32,8	+ 0 16,4	-1,5	+0 14,9	38 29 8,9	+ 0,9
9	η Ursæ Maj.	39 27 40,2							
10	α Persei	41 4 47,8							
11	Capella	44 16 51,0	44 13 20,1	- 3 30,9	- 1 45,4	-4,6	-1 40,8	44 11 39,3	+ 2,1
12	α Cygni	45 34 51,9	45 25 39,2	- 9 12,7	- 4 36,3	+1,7	-4 38,0	45 21 1,2	+ 3,9
13	α Lyrae	51 25 46,6	51 23 36,5	- 2 10,1	- 1 5,0	+2,2	-1 7,2	51 22 29,3	+ 4,9
14	Castor	57 36 10,2	57 41 14,2	+ 5 4,0	+ 2 32,0	+3,8	+2 35,8	57 43 50,0	+ 2,0
15	Pollux	61 24 27,9	61 30 12,2	+ 5 44,3	+ 2 52,1	+3,6	+2 55,7	61 33 7,9	+ 1,1
16	β Tauri	61 37 30,4	61 34 32,9	- 2 57,5	- 1 28,7	-4,0	-1 24,7	61 33 8,2	+ 2,2
17	α Androm.	62 15 26,8	62 0 48,0	-14 38,8	- 7 19,4	0,0	-7 19,4	61 53 28,6	+ 3,9
18	α Cor. Bor.	62 26 59,7	62 36 11,8	+ 9 12,1	+ 4 36,0	-2,1	+4 33,9	62 40 45,7	+ 2,5
19	α Arietis	67 42 12,4	67 29 22,0	-12 50,4	- 6 25,2	-1,7	-6 23,5	67 22 58,5	+ 3,2
20	Arcturus	69 32 13,2	69 46 10,0	+13 56,8	+ 6 58,4	-1,5	+6 56,9	69 53 6,9	+ 3,3
21	Aldebaran	74 0 14,9	73 54 17,7	- 5 57,2	- 2 58,6	-3,4	-2 55,2	73 51 22,5	+ 3,0
22	β Leonis	74 3 55,1	74 18 34,7	+14 39,6	+ 7 19,8	+0,3	-7 20,1	74 25 54,8	+ 3,4
23	α Herculis	75 18 45,6							
24	α Pegasi	76 6 10,2	75 52 0,2	-14 10,0	- 7 5,0	+0,9	-7 5,9	75 44 54,3	+ 6,9
25	γ Pegasi	76 10 25,7	75 55 38,7	-14 47,5	- 7 23,7	0,0	-7 23,7	75 48 14,5	+ 7,8
26	Regulus	76 51 4,7	77 3 36,5	+12 31,8	+ 6 15,9	+1,8	+6 17,7	77 9 54,2	+ 3,8
27	α Ophiuchi	77 14 35,4	77 16 55,1	+ 2 19,7	+ 1 9,8	-3,0	+1 6,8	77 18 1,9	+ 5,5
28	α Aquilæ	81 45 27,3	81 38 53,0	- 6 34,3	- 3 17,1	+2,9	-3 20,0	81 35 33,0	+ 5,7
29	α Orionis	82 39 41,8	82 38 33,0	- 1 8,8	- 0 34,4	-3,4	-0 31,0	82 38 2,0	+ 3,7
30	α Serpentis	82 47 24,2	82 56 4,2	+ 8 40,0	+ 4 20,0	-2,5	+4 17,5	83 0 21,7	+ 3,3
31	Procyon	84 10 9,8	84 16 21,1	+ 6 11,3	+ 3 5,6	+3,1	+3 8,7	84 19 29,8	+ 4,8
32	α Ceti	86 52 57,7	86 42 9,5	-10 48,2	- 5 24,1	-2,2	-5 21,9	86 36 47,6	+ 3,8
33	α Aquarii	91 29 41,4	91 17 4,7	-12 36,7	- 6 18,3	+1,7	-6 20,0	91 10 44,7	+ 3,9
34	α Hydræ	97 36 50,2	97 47 52,4	+11 2,2	+ 5 31,1	+2,0	+5 33,1	97 53 25,5	+ 3,8
35	Rigel	98 30 10,9	98 26 34,7	- 3 36,2	- 1 48,1	-2,9	-1 45,2	98 24 49,5	+ 3,7
36	Spica Virg.	99 52 48,3	100 6 41,9	+13 53,6	+ 6 56,8	-1,1	+6 55,7	100 13 37,6	+ 4,3
37	2α Capricor.	103 16 53,0	103 9 9,9	- 7 43,1	- 3 51,6	+3,1	-3 54,7	103 5 15,2	+ 2,2
38	Sirius	106 23 56,7	106 27 3,1	+ 3 6,4	+ 1 33,2	+2,7	+1 35,9	106 28 39,0	+ 5,3

TABLE V.

		N. P. D. 1800. Interpolated.	N. P. D. 1813. Interpolated.	Ann. Var. 1795.	N. P. D. 1790.	Ann. Var. 1785.	N. P. D. 1780.
1	α Cassiopeia	34 33 42,4	34 29 24,2	—19,87	34 37 1,1	—19,87	34 40 19,8
2	Polaris		1 41 21,9				
3	α Arietis	67 29 24,3	67 25 38,1	—17,42	67 32 18,5	—17,44	67 35 12,9
4	α Ceti	86 42 11,8	86 39 2,3	—14,62	86 44 38,0	—14,65	86 47 4,5
5	α Persei	40 51 45,7	40 48 53,5	—13,54	40 54 1,1	—13,58	40 56 16,9
6	Aldebaran	73 54 19,7	73 52 36,6	—7,99	73 55 39,6	—8,04	73 57 0,0
7	Capella	44 13 21,1	44 12 21,9	—4,66	44 14 7,7	—4,72	44 14 54,9
8	Rigel	98 26 37,2	98 25 35,4	—4,79	98 27 25,1	—4,83	98 28 13,4
9	β Tauri	61 34 32,9	61 33 44,3	—3,90	61 35 11,9	—3,96	61 35 51,5
10	α Orionis	82 38 35,5	82 38 17,4	—1,43	82 38 49,8	—1,48	82 39 4,6
11	Sirius	106 27 6,8	106 28 4,1	+4,38	106 26 23,0	+4,34	106 25 39,6
12	Castor	57 41 15,8	57 42 47,7	+7,01	57 40 5,7	+6,96	57 38 56,1
13	Procyon	84 16 24,8	84 18 16,7	+8,57	84 14 59,1	+8,53	84 13 33,8
14	Pollux	61 30 13,3	61 31 56,8	+7,90	61 28 54,3	+7,85	61 27 35,8
15	α Hydræ	97 47 55,0	97 51 12,3	+15,16	97 45 23,4	+15,13	97 42 52,1
16	Regulus	77 3 39,4	77 7 23,2	+17,19	77 0 47,5	+17,17	76 57 55,8
17	α Ursæ Maj.	27 10 22,7	27 14 31,1	+19,21	27 7 10,6	+19,20	27 3 58,6
18	β Leonis	74 18 37,0	74 22 57,6	+20,04	74 15 16,6	+20,04	74 11 56,2
19	γ Ursæ Maj.	35 11 35,3	35 15 55,0	+19,97	35 8 15,6	+19,97	35 4 55,9
20	Spica Virg.	100 6 44,6	100 10 51,2	+18,98	100 3 34,8	+19,00	100 0 24,8
21	η Ursæ Maj.	39 41 1,9	39 44 58,0	+18,17	39 38 0,2	+18,19	39 34 58,3
22	Arcturus	69 46 12,3	69 50 19,3	+19,04	69 43 1,9	+19,06	69 39 51,3
23	β Ursæ Min.	14 59 29,3	15 4 48,4	+14,72	14 57 2,1	+14,72	14 54 34,9
24	α Cor. Bor.	62 36 13,6	62 38 56,0	+12,53	62 34 8,3	+12,56	62 32 2,7
25	α Serpentis	82 56 6,5	82 58 39,4	+11,80	82 54 8,5	+11,84	82 52 10,1
26	Antares	115 58 25,1	116 0 10,9	+8,73	115 56 57,8	+8,78	115 55 30,0
27	α Herculis	75 22 14,1	75 23 14,4	+4,68	75 21 27,3	+4,72	75 20 40,1
28	α Ophiuchi	77 16 58,9	77 17 40,0	+3,19	77 16 27,0	+3,23	77 15 54,7
29	γ Draconis	38 28 54,6	38 29 3,7	+0,72	38 28 47,4	+0,74	38 28 40,0
30	α Lyrae	51 23 38,9	51 23 1,1	—2,93	51 24 8,2	—2,90	51 24 37,2
31	α Aquilæ	81 38 56,8	81 36 59,9	—8,12	81 40 18,0	—8,09	81 41 38,9
32	α Cygni	45 25 41,8	45 22 58,4	—12,54	45 27 47,2	—12,52	45 29 52,4
33	α Cephei	28 15 28,7	28 12 13,3	—15,02	28 17 58,9	—15,00	28 20 28,9
34	β Cephei	20 6 22,2	20 15 30,8	—15,66	20 8 58,8	—15,65	20 11 35,2
35	α Aquarii	91 17 7,4	91 13 23,7	—17,17	91 19 59,1	—17,15	91 22 50,6
36	α Pegasi	75 52 4,8	75 47 54,3	—19,23	75 55 17,1	—19,22	75 58 29,3
37	α Andromed.	62 0 50,8	61 56 31,7	—19,92	62 4 10,0	—19,92	62 7 29,2

TABLE VI.

Names of Stars.	Bradley. 1756.	Mayer. 1756.	Mayer corrected.	Difference between Bradley and Mayer.
Capella	° 44 16 51,0	° 44 16 49,3	" 52,8	—1,8
α Cygni	45 34 51,9	45 34 48,4	51,9	0,0
α Lyrae	51 25 46,6	43,6	47,1	—0,5
Castor	57 36 10,2	6,9	10,4	—0,2
Pollux	61 24 27,9	23,4	26,9	+1,0
β Tauri	61 37 30,4	27,7	31,2	—0,8
α Androm.	62 15 26,8	22,4	25,9	+0,9
α Arietis	67 42 12,4	7,1	12,6	—0,2
Arcturus	69 32 13,2	12,8	16,3	—3,1
Aldebaran	74 0 14,9	11,9	15,4	—0,5
β Leonis	74 3 55,1	53,9	57,4	—2,3
α Pegasi	76 6 10,2	5,2	8,7	+1,5
Regulus	76 51 4,7	0,0	3,5	+1,2
α Ophiuchi	77 14 35,4	32,6	36,1	—0,7
α Aquilæ	81 45 27,3	23,4	26,9	+0,4
α Orionis	82 39 41,8	41,1	44,6	—2,8
α Serpentis	82 47 24,2	18,3	21,8	+2,4
Procyon	84 10 9,8	8,7	12,2	—2,4
α Ceti	86 52 57,7	50,6	54,1	+3,6
α Aquarii	91 29 41,4	36,3	39,8	+1,6
α Hydræ	97 36 50,2	46,1	49,6	+0,6
Rigel	98 30 10,9	9,5	13,0	—2,1
Spica Virg.	99 52 48,3	45,2	48,7	—0,4
Sirius	106 23 56,7	54,2	57,7	—1,0
Antares	115 51 57,3	54,8	58,3	—1,0
γ Pegasi	76 10 25,7	22,1	25,6	+0,1
z α Capricor.	103 16 53,0	49,0	52,5	+0,5

The French astronomers, in their Trigonometrical Operations, employed six stars, whose declinations for the year 1793, they determined with a singular degree of precision with their repeating circle, viz.

N. P. D.

1793 α Draconis	$25^{\circ} 37' 52,05''$
ζ Urs. Maj.	$33^{\circ} 59' 21,30''$
Capella	$44^{\circ} 13' 50,40''$
Pollux	$61^{\circ} 29' 15,20''$
β Tauri	$61^{\circ} 35' 0,50''$
1796 β Urs. Min.	$15^{\circ} 0' 40,37''^*$

By combining these with BRADLEY'S observations in 1753, I compute their predicted places for 1823, and find them by observation as follows :

β Urs. Min.	$3,5''$ North of its predicted place.
α Draconis	$3,5''$ North.
ζ Urs. Maj.	$1,3''$ South.
Capella	$6,0''$ South.
Pollux	$4,0''$ South.
β Tauri	$3,0''$ South.
Sirius	$7,0''$ South, from a determination of MECHAIN with the repeating circle in 1800.

The above are the best authorities that can be found from the time of BRADLEY to the year 1813.

* The Westbury determination of β Ursæ Minoris differs $2''$ from this ; and as the observations were made on the star both above and below the Pole, it merits some confidence. The mean of the French and Westbury Observations give a northern motion equal to $1''.7$.

Computation of the Southern Motion of CAPELLA.

1753. N. P. D. - - - $44^{\circ} 17' 5,20''$ Extremely exact; from a computation by
Dr. MASKELYNE, in his own hand-
writing.

1793. N. P. D. - - - $44^{\circ} 13' 50,40''$ Arc du Meridien, page 653. BRADLEY'S
refraction.

3 14, 8 Motion in 40 years.

$$\frac{194'',8}{40} = 4,870 \text{ An. Var. in 1773.}$$

Precession $\left\{ \begin{array}{l} 1773 = 5,193 \\ 1808 = 4,974 \end{array} \right\}$ diff. = 0,217 change of precession in 35 years.

4,653 An. Var. for 1808.

30

1395, 9 = $2^{\circ} 19,6''$ predicted motion in 30 years.

1793, N. P. D. - - - $44^{\circ} 13' 50,4''$
2 19,6

44 11 30,8 predicted N. P. D. 1823.

44 11 36,8 observed N. P. D. 1823.

6,0 Star south of predicted place in 30 years.

Explanation of the preceding Tables.

TABLE I. is nearly the same as published in the Philosophical Transactions for 1806. The Greenwich Catalogue is corrected for flexure, and the other catalogues corrected each by a common quantity, so as to make the polar distance of γ Draconis $38^{\circ} 28' 54''$, the same as in the Greenwich Catalogue.

It may be doubted whether the Palermo Catalogue can, with any propriety, be introduced in this investigation, considering that the observations were made in a different latitude, and computed by a different table of refraction. The discordances in these catalogues are very considerable, and show that very little reliance can be placed even on the most probable mean of them all.

TABLE II. shows the southern motion, as deduced from the Greenwich Catalogue of 1800, corrected for the flexure of the mural quadrant.

TABLE III. in the same manner, shows the southern motion deduced from the Westbury Catalogue.

TABLE IV. shows the southern motion deduced from the mean of all the Catalogues. From this Table it appears, that however doubtful the determination may be, as deduced from any particular star, yet the general tendency of motion to the southward is so obvious, as to leave but little room to doubt of its reality.

TABLE V. contains interpolated places for the years 1780, 1790, 1800, 1813. These Tables are formed upon the supposition that no southern motion exists, but the proper motions

of all the stars are uniform : it moreover supposes the present Catalogue for 1823 exact. It has been seen, that it is quite impossible to reconcile the very best catalogues to such a supposition ; as has been particularly exemplified in the observations of Greenwich and Dublin for the year 1813. The Greenwich Observations for that year will be found very erroneous, and those of Dublin still more so. Indeed it appears to me that the Dublin observations cannot be placed in a more unfavourable point of view, than by supposing the southern motion in question not to exist.

TABLE VI, contains the Catalogues of MAYER and BRADLEY ; the former is corrected by a common quantity $3''.5$, which I find necessary to equalize the positive and negative differences.